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SELECTED TO REPRESENT
THE DEVELOPMENT OF MAP-MAKING FROM THE
FIRST TO THE SEVENTEENTH CENTURY

BY

EDWARD LUTHER STEVENSON, Ph.D.

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EDWARD LUTHER STEVENSON, PH.D.

THE AMERICAN GEOGRAPHICAL SOCIETY
NEW YORK CITY
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FOREWORD

In this exhibit the attempt has been made to illustrate the development of map-making, and the expansion of geographical knowledge as cartographically represented, from Roman days to modern times. The forty-one maps selected are typical. The fact, however, is recognized that in so limited a number of reproductions many of the details and peculiarities, which are characteristic of the maps drawn during this long period, do not appear.

These transparencies, on glass plates about 44 by 56 cm. in size, have been placed in the lecture hall windows of The American Geographical Society's Building, 156th Street and Broadway. Although they vary somewhat in their dimensions they are as nearly uniform as the peculiarities of the original maps permit. Except in few instances, where convenience in arrangement of the reproduction has directed, the order of the numbers is chronological.

The numerous maps in fac-simile which are framed and adorn the walls of the building exhibit certain features not to be found in the transparencies, and furnish additional cartographical information.

E. L. S.

February 22, 1913.

1.—PEUTINGER TABLE, Early Roman Map.

This map derives its name from Konrad Peutinger, a distinguished German humanist of the Renaissance period, who was its possessor at the time it first attracted attention, 1507. It appears to be a copy, made in the thirteenth century, of an old Roman original since lost, and is treasured not only by the Royal Library of Vienna, where it may now be found, but by all interested in the history of geographical science, as the choicest cartographical monument of antiquity.

It is properly designated an itinerary or road map, called by the Romans *ITINERARIA PICTA*, and lays down the world as then conceived by one who would have his map serve an especially practical purpose. He has indicated the Roman highways, and has represented the towns through which one would pass in going from one locality to another in the Empire, regardless of strict accuracy as to distance and direction. The eleven segments of this map, altogether more than eighteen feet in length and slightly more than one foot in width, embrace the region stretching from Spain to India. The sections here reproduced include, first, the larger part of Italy, wherein the importance of Rome as an imperial residence is emphasized by a special vignette; and second, the region to the east, wherein Constantinople appears as the most important imperial city. Though

not drawn with accurate proportions, the peculiar shape of Italy, for example, is easily recognized.

2.—WORLD MAP OF COSMAS, Sixth Century.

The world map of Cosmas was drawn to illustrate the geographical theories set forth by Cosmas Indicopleustes in his work designated "Christian Topography." The author, a monk, was probably a native of Alexandria and lived in the sixth century of the Christian Era. It is generally accepted that his "Topography" contains the oldest Christian maps which have survived. They therefore stand as representative of the earliest efforts of mediæval cartographers to picture in outline the earth's surface.

Cosmas rejects the geographical ideas of the ancients, finding in the Scriptures a basis for his theories. According to him the Bible should be accepted no less as a guide in science than as a guide to faith. The tabernacle, he thought, should be taken as a model of the earth, of the firmament, and of the heavens above, the earth occupying the floor of the universe. "Thou shalt also make a table; two cubits shall be the length thereof, and a cubit the breadth thereof . . ." Ex. xxxvii, 10, was for him a justification in representing the length of the earth as twice its breadth. A rectangular earth seems to have been justified by the statement, "I saw four angels standing on the four corners of the earth, holding the four winds of the earth," Rev. vii, 1. Beyond the encircling ocean Cosmas placed the earthly paradise whence flow the four sacred rivers, their source being hidden from man, but their waters reaching the earth by flowing beneath the encircling ocean. All this

we find laid down in his world map. He represents four indenting gulfs, at the south the Red Sea and the Persian Gulf, at the north the Caspian Sea, and at the west the Mediterranean, in accord with a belief of the time.

3.—WORLD MAP OF BEATUS, Eighth Century.

In the mountainous region of Liebana, once a part of Asturias, lived toward the close of the eighth century a Benedictine monk known in his time and to history as Beatus. As the teacher and spiritual guide of Queen Adosinda, he must have enjoyed special and rare privileges for the pursuit of his studies, since the royal residence was not far from the famous Monastery of Astorga, a home of the highest culture and learning of the time. Here he wrote his great work called "A Commentary on the Apocalypse." This work, existing to-day in many manuscript copies, is considered especially interesting by reason of its numerous miniatures in West Gothic and Byzantine Gothic style, among which may be found a world map. The map appears to have been inserted in the work principally for the purpose of illustrating the spread of Christianity over the earth. Like most mediæval maps, it is oriented with the east at the top. Here in the earth's remotest bounds the earthly paradise almost invariably may be found sketched, and the story of the Garden of Eden often is simply represented in picture. Europe, Asia, and Africa or Lybia appear, and also what is common to the Beatus maps, the region of the antipodal peoples, that is, those who live on the opposite side of the earth to us.

In this particular map Beatus has represented the

Twelve Apostles, placing each in that region to which church history and tradition assigned him. Rivers cross the map, most of which can be identified, though inaccurately drawn. Important cities are distinguished by the rough outline of a building. In every detail accuracy is wanting, but strict geographical accuracy was not then held to be important.

4.—ST. SEVER WORLD MAP OF BEATUS, Eleventh Century.

This map, about 46 by 72 cm. in size, appears to have been derived, though not in all its features, from the original Beatus world map of the eighth century. It is the most important of the ten known derivatives, and appears to have been drawn at the Monastery of St. Sever near the middle of the eleventh century. The map is now in the possession of the Bibliothèque Nationale of Paris. In its details it far surpasses the Beatus map referred to as No. 3. Though omitting, for example, the representation of the Twelve Apostles, it is filled with picture and legend showing strikingly the survival of many earlier pagan beliefs, and the influence of early mediæval geographical notions such as had been advanced in the quasi-geographical writings of Isidor, Orosius, and St. Augustine.

It will be observed that the east is placed at the top, where is sketched an elaborate representation of the earthly paradise. Around the world flows the encircling ocean, especially distinguished as water by its islands, its numerous fishes, and its crudely drawn boats. The continents and numerous localities are designated by name; important cities are distinguished by picture,

Hereford World Map, 1283. No. 5

as Rome, Constantinople, Antioch, and St. Sever in Southwestern France, with its cross-adorned church. Italy, for example, is entirely wanting its peculiar outline, and can be distinguished only through its name; the Black Sea is but a long extended arm of the Mediterranean. The Fortunate Islands are placed west of Africa. The map admirably reflects the attitude of the time towards geographical science in Christian Europe.

5.—HEREFORD WORLD MAP, 1283.

In the Cathedral of Hereford, England, hangs this remarkable map, the work of Richard of Haldingham and Lafford, says a legend written thereon. It is about five feet in diameter, drawn in colors on parchment of fine quality, and dates from the latter part of the thirteenth century. The east is at the top, which is crowned with an elaborate representation of the Judgment Day. At the four corners are the four letters spelling the mournfully suggestive word, M O R S, Death. At first view, all appears confusion in the map itself, crowded as is this veritable circle of the earth with picture and with legend. In the center is Jerusalem, doubtless given this important place in his system by the author to accord with the scriptural statement, "This is Jerusalem: I have set it in the midst of the nations and countries round about her." Islands are represented in the encircling ocean, conspicuously Great Britain and Ireland. The marvelous races described in fable and story find a place in the far-away or border regions of the earth.

One may obtain a far more intelligible understand-

ing of many of the mediæval geographical myths and fables, as, for example, of the Alexander legends, or of many a story of the classical day, from a study of this map than from the best made modern map. The Barns of Joseph (Pyramids), the Ark of Noah, the principal mountains, rivers, great gulfs and seas are represented, but have been curiously conceived and drawn.

6.—EBSTORF WORLD MAP, 1283.

In the year 1833, dust-covered and cast aside with other material as of little value, this old parchment map was found in the Benedictine convent of Ebstorf, Germany. It is one of the largest mediæval world maps known, being more than eleven feet in diameter, one of the richest in geographical details, and one of the most brilliant in colors. In a sense it appears to sum up the unscientific or quasi-scientific geographical knowledge of the Christian middle ages, resembling in this respect the Hereford Map of England, here appearing as No. 5. It is oriented with the east at the top, where, near the representation of the earthly paradise, is an elaborately drawn head of Christ. The idea of representing the world as the body of Christ is carried out by placing at the right and the left the hands, and at the bottom the feet. Jerusalem is at the center, and many of the larger as well as the smaller geographical divisions of the earth are indicated by name. Cities and towns are brilliantly represented in picture; the encircling ocean, the indenting seas and gulfs, and the principal rivers appear, but with the usual inaccuracies. The marvelous races have also their place in regions remote, as have many other traditions handed down from the days of Pliny, Solinus,

and the early Christian writers on geography. The map cannot be taken as one marking the beginning of a new, but rather as one marking the climax and conclusion of an old, era.

7.—CATALAN WORLD MAP, 1375.

Second only to the Italians in the maritime enterprises with which the middle ages closed and a new era began were the Catalonians of eastern Spain and of the neighboring Mediterranean islands. To Cresquez lo Juheu of Catalonia this world map is attributed. It appears to have been drawn for King Charles V of France, and may well be called epoch-making in its importance. More comprehensive than any of earlier date, it represents the results which had been achieved by the great overland travelers, including in particular much of the geographical knowledge brought back from the far East by Marco Polo. It gives to India a more nearly correct shape than may be found on any other map of the century. Its representation of the Atlantic islands, including the Azores, the Canaries, and the Madeira group, is unequaled by any of previous date. The expedition of Jayme Ferrer of the year 1346 down the west coast of Africa is given a detailed reference. This expedition marked a new terminus for discovery to the southward.

The map-maker filled his map with picture and legend after the mediæval style, quoting much, as stated above, from Marco Polo's narrative, and recording in particular the information brought back by traders who passed along the northern overland route into north central Asia.

8.—PIZIGANI MAP, 1367.

The Venetian brothers Francisco and Dominico Pizigani supplied the geographical information for the construction of this map which bears their name, and the date 1367. The original, belonging to the Library of Parma, is about 138 by 92 cm. in size, and is remarkably well preserved. It exhibits certain features of the portolan or sailor's charts, being crossed by numerous direction lines and containing many coast names. The geographical information, however, is not confined to the coast regions. Like the Catalan Map, No. 7, of almost equal date, it contains many legends descriptive of the localities in which they have been placed. The cities especially distinguished by the picture of a building are very numerous, the great majority of which are in the interior continental regions. The eight principal winds or directions are indicated by artistically drawn heads. For so early a date the Scandinavian or North-land region is remarkably well represented. The entire continent of Europe, with the borderlands of the Mediterranean and the Black Sea, cannot fail to attract by reason of their near approach to accuracy.

Compare, for example, the Pizigani with the Hereford World Map, No. 5, and the Catalan, No. 7.

9.—PORTOLAN CHART OF ROSELLI, 1468.

Portolan charts are the first modern scientific maps. They present a striking contrast to the mediæval cloister maps, such as the St. Sever, No. 4, or the Hereford, No. 5. They appear to date from the earliest period of our great modern maritime explorations, that is, from about 1300.

This chart by Petrus Roselli, dating from 1468, has been selected as a good representative of the type. It may be stated that the earliest examples presented in particular the Mediterranean coasts, but as the years passed more distant coast regions were included. Primarily these charts were for the use of seamen, hence the geographical nomenclature was confined almost entirely to the coasts, that is, to harbors and ports, hence the name Port or Portolan chart. They were crossed with numerous lines called compass or direction lines, radiating from centers systematically placed, which centers were often highly ornamented with compass or wind roses. Charts such as these served the early seamen of the Mediterranean, the early navigators along the Atlantic coasts of Europe and Africa, and Columbus himself with his companions and his contemporaries in their great enterprises. It was on the enlarged portolan charts that the new discoveries were first recorded, as, for example, on the Cantino Chart, No. 20, or the chart of Canerio, No. 42.

10.—CATALAN WORLD MAP, about 1450.

One of the treasures to be found in the Royal Estense Library of Modena, Italy, is this fine example of a circular Catalan world map. Among the seafaring Catalonians of the fourteenth and fifteenth centuries there appears to have been developed a remarkable skill in chart making, first as applied to the construction of portolan charts of limited coast regions, then to the construction on the same scientific principles of world charts. This chart, which in the original is about 125 cm. in diameter, gives the entire world as then known, with

the regions remote from Mediterranean Europe considerably distorted. It is the work of a skillful draughtsman, who, like his contemporaries, undertook to tell a geographical story through picture and legend, as well as to record the simple known geographical facts which might be of special value to navigators. It will be observed that along the coast lines the names of towns, harbors, and ports are particularly numerous. Africa has a peculiar shape, but gives evidence of a knowledge, though not accurate, of the trend of the coast in the region of the Gulf of Guinea. The islands are numerous which dot the Indian Ocean, a representation which was derived from the narrative of Marco Polo. Jerusalem is no longer regarded as the center of the world as in the day when Haldingham constructed the Hereford Map, No. 5. The importance of China and the Far East is noted in legends which are inscribed in the interior.

11.—VENETIAN MILITARY MAP, Fifteenth Century.

This somewhat peculiar though interesting attempt to present a bird's-eye view of a section of northeastern Italy seems to date from the latter part of the fifteenth century. Cities, rivers, and highways are laid down not with strict accuracy, but in a manner which made it a fairly serviceable military map, which it was intended to be. It doubtless was constructed in Venice, and was intended by its author to serve the useful purpose of guiding the Venetian armies in their conquests on the mainland. The important cities of the region are distinctly designated by name, and are given special promi-

nence by means of picture. In the list of cities are to be found Milan, Pavia, Como, Lodi, Cremona, with numerous others of greater or less importance.

12*a*.—MELA WORLD MAP, Fifteenth Century.

In a manuscript copy of a geographical work written by Pomponius Mela in the first century A.D., presented by Cardinal Guillaume Filaster in 1417 to the Library of Rheims, is this beautifully executed initial letter O of the word "Orbis," which with some appropriateness is made to contain a map of the world. Like the St. Denis map, its companion in this transparency, it is rather decorative than scientific. "The four angels standing at the four corners of the earth" are represented in mediæval fashion. The continents Europe, Asia, and Africa are designated, each containing a few local geographical names, as of rivers, mountains, and political divisions. It is interesting to find that Abyssinia is called the India of Presbyter John.

12*b*.—ST. DENIS WORLD MAP, Fifteenth Century.

The Chronicle of St. Denis preserved in the Sainte-Geneviève Library of Paris contains this circular map of the world, so drawn as to warrant its classification with those maps which are strikingly decorative in character. It appears to date from the last quarter of the fourteenth century and exhibits in a very general and very imperfect manner the geographical views of the period. The three continents are indicated, around which flows the encircling ocean. Very conspicuous buildings emphasize the importance of certain cities, as

Paris, Rome, Antioch, Jerusalem, Carthage, Alexandria. Without the large circle have been sketched twelve small half circles in which are the names of the winds by which direction was commonly indicated before the general use of the compass.

13.—GENOESE WORLD MAP, 1457.

This map, having the unusual oblong shape, being 42 by 81 cm. in size, represents the habitable world with its longitude practically twice its latitude. Its author, who undoubtedly was a Genoese, does not record his name, but gives 1457 as the date when his work was executed.

The map belongs to a period of transition, exhibiting an attempt to harmonize the ancient and mediæval geographical ideas with recent geographical discoveries. It is a less pretentious map than is that of Fra Mauro, though not second to it in scientific importance, attracting at first by reason of its numerous legends, its architectural subjects, its crowned kings, and its marvelous animals of land and sea. The continent of Europe is well drawn; Asia and Africa are less accurate, though they exhibit a marked advance in geographical knowledge over that recorded in previous maps. Much of the information relative to the distant East appears to have been drawn especially from the Italian traveler Nicolo Conti and from Marco Polo. The author gives us one of the earliest representations of the Chinese Wall, makes record of the Chinese junks built with compartments such as may now be found in the best ocean-going vessels, and adds much interesting information concerning Cathay or

China, the interior of both Asia and Africa, and the navigation of the Indian Seas.

14.—WORLD MAP OF FRA MAURO, 1459.

In the Ducal Palace of Venice may be found this very remarkable map of the world drawn by the Camaldolese monk, Fra Mauro, in the years 1457 to 1459.

The work of that great patron of maritime exploration, Prince Henry the Navigator of Portugal, had now been almost completed, and the prime purpose for the draughting of this map appears to have been to sum up that work and to give it permanent record in a great world map, which map should also exhibit as fully as possible the complete status of geographical knowledge up to that date. The original has a diameter of more than six feet. It far surpasses in the gorgeousness of its execution and the richness of its details any world map hitherto constructed. Many of the peculiar features to be found in the work of mediæval map-makers are to be found in the work of this monk of Murano, but it marks so great an advance, incorporating as it does so many of the scientific features of the portolan charts, that it becomes one of the most important examples of a new era of map making.

The whole proportion of things recorded—rivers, mountains, towns, descriptive legends—is, however, exaggerated, especially in the regions remote from southern Europe. One becomes somewhat bewildered in attempting to make the map serve as a geographical guide. The peculiar outline of the continent of Africa and of Asia is in part due to the circular form of the map, but in greater part to imperfect knowledge.

15.—PTOLEMY WORLD MAP, 1486.

During the fifteenth century, and by many during the following century, Ptolemy was recognized as the best authority on geography. In the second century of the Christian era he had prepared his great work on Cosmography, which probably was accompanied by a series of maps, since he gave therein specific instruction as to the best manner of draughting them. During the middle ages this work of Ptolemy suffered an eclipse, but in the period of great geographical explorations it was rediscovered and he became anew a teacher in his chosen field. Ptolemy's maps were first printed in Italy about 1475. The Ulm edition of 1482 was the first edition printed in Germany. It is in the German edition of 1486, which, like the preceding, was also printed in Ulm, that the world map here reproduced may be found.

According to Ptolemy's idea the habitable world is about seventy degrees in width, stretching from western Europe to the extremes of Cathay. Among his conspicuous errors may be noted the connection of Africa on the south with eastern Asia by an unexplored continent, thus making of the Indian Ocean an enclosed sea. The Mediterranean is given too great a longitudinal extension, an error retained in most maps of the region until the seventeenth century. He had a misconception of the shape of India, of Scotland, and of the distance from the Sea of Azov to the Baltic, as of many other geographical details of which we now have accurate knowledge. In this world map the wind heads are retained, that is, the winds or direction being personified as with the ancients.

Ptolemy World Map, 1486. No. 15.

16.—BERGHAUS WORLD MAP, 1909.

This map has been especially selected to show, by contrast with the Ptolemy World Map, the earth's surface as now known, and to mark the advance in map drawing and map printing from 1486, when Ptolemy's map, one of the first engraved world maps, was issued, up to the present time.

17.—WORLD MAP OF JUAN DE LA COSA, 1500.

This map, the work of a companion and officer of Columbus on his first trans-Atlantic voyage, is the oldest known map on which the New World is represented. An inscription on the left tells us that "Juan de la Cosa made it at the Port of Santa Maria in the year 1500." The original, 180 by 96 cm. in size, now preserved in the Naval Museum at Madrid, was found by Baron Walckenaer in the year 1832 in an old Paris bookshop, and was later purchased by the Spanish Government for 4,020 francs. The author drew his map on parchment, adding to it the rich colors found in mediæval illustrated manuscripts. The New World appears on the left, not accurately drawn, but with so near an approach to accuracy as to enable one to identify numerous localities represented on the Atlantic coast. In the extreme north of this Atlantic coast appears the legend, "Mar descubierta por Ingleses" (Sea discovered by the English), which seems to point to a knowledge of the Cabot expedition of 1497. The West Indian Islands are conspicuous, giving evidence of a fairly accurate knowledge of the island of Cuba. The map does not show that the author believed the newly discovered region was

a part of Asia; quite the contrary, though he was uncertain of the extent of the country.

The continent of Africa is remarkably well drawn, while the Far East gives evidence of very uncertain geographical knowledge.

The map exhibits some of the characteristics of the mediæval cloister maps, telling in picture, for example, of the Wise Men coming out of the East guided by the Star, and of Gog and Magog, the destructive races of northeast Asia, doubtless meaning thereby the Mongols or Tartars. It well represents the geographical notions of the time.

18.—MARTIN BEHAIM GLOBE, 1492.

In the very year in which Columbus crossed the Atlantic on his first voyage of discovery, Martin Behaim in Nürnberg was engaged in the construction of this oldest known terrestrial globe. The author had passed some years in Portugal, perhaps had met Columbus and talked over with him the problems of western oceanic exploration, and may have influenced him with his geographical ideas. The globe is one of striking interest because of its date and because of its summary of geographical knowledge recorded at the very threshold of a new era. Behaim tells us that his map was based upon Ptolemy, upon the travels of Marco Polo and of Sir John Mandeville, and upon the explorations carried on by King John of Portugal. It has a diameter of about 20 cm.; is drawn on parchment which has been mounted on a prepared globe shell, and is now preserved in the archives of the Behaim Family of Nürnberg.

That half of the globe here represented includes the

continent of Asia with the bordering oceans to the east and the south. The principal islands of these oceans are indicated and include Cipangu (Japan), Java, Zanzibar, Madagascar, Taprobana, each of which is described in an elaborate legend, as the several regions have been so described where space has permitted. These geographical records are among the most interesting features of the globe.

19.—MARTIN BEHAIM GLOBE, 1492.

That half of the Behaim globe here represented includes the continents of Europe and Africa, together with the great expanse of the Atlantic Ocean embracing its islands which were then known, that is, the Azores, the Canaries, the Madeira group, and the Cape Verde Islands. The New World very naturally does not appear on the globe. The author has much underestimated the distance from Portugal to China, erroneously representing Japan as near the actual longitude of Mexico. The newly discovered Spanish and Portuguese possessions, in particular, are indicated by appropriate banners. The fabulous islands of the Atlantic are laid down, each with a legend telling the commonly accepted story concerning it, among which islands we find Saint Brandans, Antillia, and the Island of the Seven Cities. Africa is interestingly drawn, exhibiting among other features the last vestige of that extension to eastward, at its southern extremity, which Ptolemy made to reach even to the east coast of Asia.

20.—WORLD MAP OF CANTINO, 1502.

An especial distinction belongs to the Cantino chart by reason of the fact that it contains the second oldest known attempt to sketch the New World which has come down to our day. The original is a planisphere on parchment, richly colored, measuring 220 by 100 cm., and is preserved as one of the priceless treasures of the Royal Estense Library of Modena, Italy.

Cantino was the special envoy of Hercules, Duke of Ferrara, at the Court of Portugal, and as such he was commissioned to obtain for the Duke a map especially illustrating, to date, the trans-Atlantic discoveries made under the Portuguese and Spanish flags. We learn from a letter written by Cantino that the chart cost in Portugal by contract twelve gold ducats. Crossed by numerous compass or direction lines, adorned with numerous compass or wind roses, with its geographical nomenclature practically confined to coast regions, it is readily distinguished as a portolan or seaman's chart, such as is represented in No. 9, but a portolan chart now become a world chart. The Old World is well drawn, in particular the continent of Africa, whose coast regions had so long claimed the attention of the Portuguese. The newly discovered land in the west includes Newfoundland or the Labrador coast claimed for Portugal by reason of the Cortereal discoveries, and so designated by the Portuguese flag. A north continental region, North America, but unnamed, is indicated terminating at the south in a point of land which unmistakably is a representation of Florida. The south continental region, South America, but also unnamed, includes a section of the north and northeast coast of South America. The

West Indian Islands, notably Isabella or Cuba, and Haiti, are made duly prominent. Cantino adorned his chart with picture of city and landscape, giving us in South America one of the first attempts to illustrate the attractiveness of American fauna and flora.

21.—MAP OF JOHANN RUYSCH, 1508.

In 1508 there was issued from a Rome printing press an edition of Ptolemy's Geography or Cosmography, containing a new map of the world bearing the title "A more universal map of the known world constructed by means of recent observations." It was the work of a certain German, Johann Ruysch by name, concerning whom we have very little information. The map attracts in particular by reason of its new and peculiar projection, in which the North Pole appears to be placed at the center, giving us what is commonly called the polar projection. Until the recent discovery of the Waldseemüller world map of 1507 it passed as the oldest known engraved map on which the New World was represented. Greenland and the Newfoundland region discovered by the Cortereals is made a part of Asia. But little of the North American continent is represented, while South America is conspicuous, bearing the name "Terra Sanctæ Crucis," given to it by Cabral in 1500, and also "Mundus novus," the name employed by Amerigo Vespucci. Japan, or Cipangu, as represented on the Behaim Globe, No. 18, is omitted, because, as the author states, he thinks the newly discovered region in the North, that is, North America, is identical therewith. The Old World exhibits in a general way the progress made in discovery to date, but displays many of the features of Ptolemy's

maps. This reproduction is made from the only known manuscript copy of the map, probably drawn as early as 1512 by Glareanus.

22.—SYLVANUS WORLD MAP, 1511.

This cordiform world map appears in an edition of Ptolemy issued at Venice in 1511 by Bernardo Sylvanus of Eboli. It has the distinction of being one of the first maps printed with color, though the only color employed was red, and this alone for a part of the nomenclature. The form of the map seems to exhibit the influence of Waldseemüller's world map of 1507. The geographical data for the New World appear to have been derived from Portuguese sources, such as may be found in the charts of Cantino and Canerio. The Labrador region is called "regalis domus," a curious and confused allusion to the Cortereal discoveries. South America is called "terra sanctæ crucis." India and the Far East are somewhat Ptolemaic in outline. Wind heads are numerous, but the author has employed in most instances double names to designate direction, as Zephyrus and Occidens, or Boreas and Septentrio. The map exhibits an attempt to bring Ptolemy's cartographical representations up to date.

23.—GLAREANUS WORLD MAP, about 1512.

Glareanus was one of those many-sided geniuses of the Renaissance, being philosopher, man of letters, historian, mathematician, astronomer, and geographer. In one of his manuscripts, until recently in the possession of Colonel E. Renouard James, of London, may be found this map with six others, which map is here reproduced

for the first time. It represents the world, somewhat roughly drawn, on the projection employed by Waldseemüller in his world map of 1507. The New World appears as two large islands or continents, with two or three of the more important islands of the West Indian group. It is one of the first maps on which the name AMERICA appears.

Most of the maps of the first quarter of the sixteenth century represent, as does this one, a strait between North America and South America. It was that for which search was so frequently made in those early years, and which the map makers, though clearly wanting positive information, were accustomed to represent on their maps. It is the representation of a hope rather than of a fact.

24.—TYPICAL EARLY MAPS OF THE WORLD.

In this number an attempt has been made to bring together, for purposes of comparison, nine typical early maps of the New World.

1. A Portuguese map of about 1502 which omits North America, but exhibits the West Indian Islands, with Cuba extending quite as far north as England, representing an idea expressed by Columbus.

2. The Cantino chart of 1502 which represents, for example, North America, but does not express with certainty that this continent is bordered by a western ocean.

3. The Ruysch map of 1507, exhibiting a peculiar uncertainty concerning North America, making Greenland a part of northeast Asia and omitting Japan, because it was thought to be identical with the newly discovered regions of the Spanish.

4. The Glareanus map of about 1512 makes North America clearly appear as an independent continent, separated from South America and bordered on the east as well as on the west by the ocean.

5. The Stobnicza map of 1511, being an exact copy of Waldseemüller's map of 1507 on which for the first time a land connection between North and South America was represented.

6. The Maiollo map of 1527, giving practically the entire Atlantic coast of the New World and the west coast with the peculiar indentation of Verrazanian origin.

7. The Gastaldi map of 1548, representing both the idea of an Asiatic connection of the New World and at the same time a belief in its European connection at the north.

8. Agnese chart of about 1546, being a typical early Spanish representation of the New World with its too rapid trend to eastward of the Atlantic coast of North America, but with the general coast features fairly well done.

9. The rare Gilbert map of 1576, representing a northwest passage, and North America independent of Asia.

25.—MAP ATTRIBUTED TO REINEL, about 1516.

The original of this map, attributed to the cartographer Pedro Reinel, who was one of the most famous map makers of the early sixteenth century, may be found in the Bibliothèque Nationale of Paris. It embraces the western parts of Europe and Africa, the central and northern Atlantic and the mainland of the New World

in three disconnected sections: the first designated as "terra corte regalis," or the region of Labrador, and eastern Canada; the second as "terra Bimene," an early name for the Florida region; the third as "mundus novus," or the northeastern section of South America, together with a fourth section, the West Indian Islands, which have no general designation. The map is particularly striking from an artistic standpoint, being decorated with numerous banners representing Spanish and Portuguese territorial ownership, with vessels sailing hither and thither over the Atlantic, and with numerous landscapes wherein are pictured various animals and forests. The coast names are principally Portuguese and are written in red and black, while the legends are for the most part in the Latin language. The sources of the map are largely Portuguese, though the author has clearly indicated an acquaintance with certain Spanish records.

26.—WORLD MAP OF APIANUS, 1520.

Apianus, a noted German cosmographer and mathematician, prepared the original of this map in 1520. He borrowed his geographical records largely from Portuguese sources, or from contemporary Lusitanio-Germaniac map makers, notably from Waldseemüller, whose map of 1507 he practically copied. This map of Apianus was long considered to be the first engraved map on which the name America appears, but the discovery, twelve years since, of Waldseemüller's great world map, referred to above, deprived it of this distinction.

The original is a well-executed woodcut, 29 by 42 cm. in size, and represents both the Old and the New World.

Spanish flags mark the discoveries and claims of that country in the west. A part of the north continental land here represented is called Parias, but across the south continental area the word AMERICA is conspicuously printed. Apianus states that this southern region was discovered in 1497, apparently recognizing the claims of Vespucci, but he immediately proceeds to modify this claim somewhat by stating that this land with the adjacent islands was discovered in 1497 by Columbus, a Genoese.

27.—RIBERO WORLD MAP, 1529.

Diego Ribero is reputed to have been one of the most distinguished cosmographers, that is, geographers, of the early sixteenth century. His world maps appear to have been based upon the official geographical records collected by order of the Spanish Sovereign and preserved in the archives of the Casa de Contratación. The map dates from 1529, and is remarkable for its fullness of geographical information and the near approach to accuracy of its details. The original may be found in the Museum of the Propaganda, Rome.

The map represents the New World as one land mass, giving the entire Atlantic coast line from Labrador to the Strait of Magellan, with a section of the Pacific coast from southern Mexico to Peru. Certain conspicuous features of early portolan charts are retained, as, for example, the crossing lines and the compass roses. The descriptive legends are numerous, and are of great historical interest. We read, for example, that there is nothing worth obtaining in Labrador; that no gold can be found in the region visited by Gómez, that is, the

eastern United States of the present, because it is too far from the tropics; that New Spain, by which Mexico is meant, is so called because it contains products to be found in Old Spain; that gold and silver can be found in the interior of the La Plata region. The Old World has been well drawn. Here the names and legends seem to have been inserted with the same attention to details and accuracy that we find in the case of the western hemisphere. The papal Line of Demarcation is the prime meridian; degrees of latitude and longitude are marked; trade routes are indicated by well-drawn sailing vessels.

28.—MUNICH-PORTUGUESE MAP, 1519.

In the Royal Library of Munich may be found this Portuguese map drawn on parchment and exquisitely colored. In size it is 63 by 125 cm. Neither date nor author's name appears on the map, but there is evidence that it was made about the year 1519. It is the oldest map known on which attention is called to the discovery of the Pacific by Balboa, though his name does not appear. This reference we find in a legend in the ocean to the west of South America. Near the western coast line is represented an exploring party in open boats.

Labrador is indicated as an isolated region to the west of Europe, to the southwest of which is "Terra Bimini," that is, Florida, likewise isolated and with an indefinite outline, as if doubt were entertained whether to represent it as an island or a continental region. The eastern coast line is continuous from Yucatan to the La Plata River. The map is one of the oldest known on which the Line of Demarcation is represented as the prime meridian. For African and East Indian discov-

eries it is one of great value as well as one of importance for its representation of discoveries in the New World. Descriptive legends are numerous. The map is highly ornamented with ships, tents of barbarian kings, flags, mountains, in the draughting of which skill of a high order is indicated.

29.—PORTUGUESE MAP OF SOUTH AFRICA AND THE FAR EAST, about 1513.

This Portuguese map, neither signed nor dated, has been thought to have been constructed as early as 1513. It includes the coast region of the Old World from the Gulf of Guinea on the west of Africa to southeastern Asia, together with the Moluccas or a portion of the East Indian Islands. For the latter representation it is a map of striking importance. A very significant feature is the apparent indication of a coast line on the right which has been taken to be a representation of the west coast of North America. If this conjecture is correct, it is a record of special interest, since it will be remembered that this coast is thought not to have been visited by European explorers until a much later date. It may be the record of an expedition concerning which we have no other information.

30.—GLOBE OF JOHANN SCHÖNER, 1520.

In the German National Museum of Nürnberg may be found this mounted wooden globe, the work of Johann Schöner, a noted cosmographer and mathematician. It bears date 1520 and has a diameter of 35.5 cm. Schöner is known to have drawn several globe maps, the first

in 1515. The work here represented is, however, his best that has been preserved. His geographical information was received from German and Portuguese sources, and he gives us practically the same representation on a globe that Waldseemüller gives in a plane map. The continents of both North and South America he represents as large islands, the former curiously bearing the name "Terra de Cuba," and the latter "America vel Brasilia sive Papagalli Terra," that is, America or Brazil or the Land of Parrots. Japan is in close proximity to the west coast of North America, and Newfoundland or "Terra Corte Realis" is a large island to the northeast. In the south, beyond South America, is represented a large land area designated as "Brasilia Inferior." It is especially interesting here to note that a strait separates this land from his "America," as a strait separates North from South America, and that this representation dates from 1520. Schöner had indeed indicated this strait, which is now called the Strait of Magellan, on his globe map of 1515.

31.—WORLD MAP OF SEBASTIAN MÜNSTER, 1540.

In the Basel edition of Ptolemy's Geography, printed in 1540, is a world map by Sebastian Münster. This map gives evidence of a decline among the Germans of that cartographical skill which they had exhibited in the earlier years of the century. Certain Ptolemaic features are retained in the map, but the New World is given due prominence. That indentation on the west coast of North America is exhibited, which peculiarity

had its origin in the report of Verrazano and which appears so prominent in the Verrazano map of 1529, though it had earlier been represented by Maiollo in his map of 1527. For the first time in a map of the New World, Münster indicates a passage or strait between "Bacalhos" in the north, by which name Greenland seems to be meant, and "Francisca" on the south, which is a name for the Canadian region, through which strait one might pass to the Moluccas. Though marking such a passage on his map, it actually was first traversed by Amundsen in 1905. North America is called "Terra Florida," though its western part, represented on the map as lying to the east of Asia, is called "Temistitan," which is an early name for Mexico.

32.—WORLD MAP OF MARTINES IN HEMISPHERES, 1562.

The first of the charts in a portolan atlas dated 1562 by Giovanni Martines is a representation of the world in two hemispheres. Martines was one of the foremost Italian chart makers of his day, being not only a skillful draughtsman, but also a careful and critical student in the field of chart making. Each of the hemispheres in the original has a diameter of about 16 cm., or nearly four inches. These hemispheres are therefore somewhat enlarged in this reproduction. Meridians and parallels are drawn at intervals of fifteen degrees. In his general continental outlines his representations are fairly accurate, but a striking feature is his great Austral Continent which he calls "terra incognito." No earlier chart is known on which there is a reference to Anian, a name once applied to the Bering's Strait. Geograph-

ical names are not numerous, and those given are of local territorial areas.

33.—WORLD MAP OF AGNESE, about 1545.

Batista Agnese was one of the most prolific portolan chart and atlas makers of the sixteenth century. As a draughtsman and miniaturist he exhibited remarkable skill, holding a foremost place, in particular, among his Italian contemporaries. His work, however, appears to have been done rather for the libraries of princes than for the practical use of mariners. This world map, selected from the best known copy of his atlases, is typical. The continents are well drawn, but the general effect is artistic rather than scientific. A very common feature of his world maps is the representation of the course followed by the Magellan expedition, which was the first to circumnavigate the globe.

34.—DESCELIERS WORLD MAP, 1550.

This map is representative of the best work done by French cartographers about the middle of the sixteenth century. The original, belonging to the British Museum, is 215 by 135 cm. in size, and is remarkable for its artistic and scientific merit. The author expresses a disbelief in an Asiatic connection of America; a belief in such connection, it may be said, being generally entertained at that time. It is rich in nomenclature which is of particular interest for the region of French discoveries in the New World.

The sources for the map appear to be largely French, and only in part Spanish or Portuguese. The Atlantic coast line of North America is a decided improvement

on that coast as represented in earlier maps. While the decorations of the map are somewhat profuse, they are, however, in keeping with the best artistic work of contemporaneous cartographers.

35.—CABOT WORLD MAP, 1544.

In one of the inscriptions on this map we read that it was drawn by "Sebastian Cabot, captain and Pilot Major of his Sacred Imperial Majesty the Emperor Don Carlos, the fifth of this name, in the year 1544." Though the map is referred to as the work of Cabot there is considerable uncertainty as to the part he took in its construction. The original is 220 by 120 cm. in size, including the two columns of inscriptions. At this time Cabot was in the employ of Spain, but it seems probable that the map was engraved in the Netherlands. It appears to represent the coast of the New World to that most northern point reached by Cabot in 1498, the entrance to Davis's Strait, the Strait of Belle Isle as surveyed by Cartier in 1534, and the Gulf and River St. Lawrence. The entire Atlantic coast is well drawn, but the west coast of North America extends only to that point reached by Castilo in 1541, whose map of the region seems to have been incorporated in the Cabot map. There are many errors in details, but in the general geographical outline the work has been well done for the period. It is from one of the inscriptions, No. 8, that we learn Newfoundland was discovered by John Cabot and Sebastian, his son, June 24, 1497, here, however, erroneously written 1494. The projection is that which, for example, we find in the Ortelius map, No. 37. The map is adorned with an artistic picture of the Annuncia-

tion and the Imperial coat-of-arms and with four wind heads, as in certain earlier maps.

36.—WORLD MAP OF FORLANI, 1565.

This map of the Italian Forlani of 1565 is a good example of the excellent work in copper engraving done in Italy about the middle of the sixteenth century. Though the Italian map makers established for themselves an enviable reputation in the fourteenth and fifteenth centuries and found employment in Spain and Portugal in the opening years of their great trans-oceanic discoveries and explorations, they were slow in giving fitting prominence to these discoveries in their cartographical work done at home; that is, they were much inclined to hold to tradition. As artistic draughtsmen they always exhibited great skill. In the first half of the sixteenth century, when copper engraving was coming into favor, they applied most successfully the new art to map work. Forlani's work, it will be noted, retains the artistic and fanciful wind heads. The form of his map gives rise to certain distortions. In outline his New World is of Portuguese origin.

37.—ORTELIUS WORLD MAP, 1564.

Abraham Ortelius, a distinguished geographer and mathematician of the Netherlands, issued in 1564 this world map, 150 by 87 cm. in size, which in its projection shows strikingly the influence of Waldseemüller's great map of 1507. The only known copy of the map may be found in the University Library of Basel, Switzerland. It is a carefully prepared piece of work, though exhibiting numerous errors in its details, and many distortions

by reason of its projection. This is the only reproduction of the map which has ever been made.

38.—ORTELIUS WORLD MAP, 1570.

Ortelius is especially known through his great work issued at Antwerp in the year 1570, which work is commonly referred to as the first modern atlas. It contains fifty-three maps with accompanying text, most of which maps were reproductions, more or less modified, of the work of other cartographers. Perhaps one of the greatest services rendered by Ortelius was his part in the elimination from world maps of many of the lingering Ptolemaic and mediæval traditions.

His world map, here reproduced, is one of the most interesting of those he placed in his atlas. Certain distortions are noticeable, occasioned by his peculiar, though not hitherto unknown projection, and numerous errors appear in those regions which were little known. North America has a breadth entirely too great. South America has an unaccountable extension on the southwest, which peculiarity was long retained in the Mercator and the Ortelius maps. His "terra Australis" is a most conspicuous feature, quite equaling in extent the area of the known continents. In the extreme north he likewise has indicated extensive land areas. It may be noted that he gives the name America only to North America, and that he has no general name for South America.

39.—MERCATOR WORLD MAP, 1569.

The Flemish mathematician and geographer Gerhardus Mercator has a place of foremost rank among

those who have made contribution to geographical science.

In 1569 his great world map, here reproduced, was drawn on what has since come to be known as the "Mercator Projection." In this the parallels and meridians intersect at right angles. For regions near the equator the representation is very nearly accurate, but the exaggeration in latitude increases toward the poles, where it is at infinity. This great planisphere, according to its title, was intended for the use of navigators, its peculiar construction admirably fitting it for the purpose. The great distortion especially noticeable in North America is due to the application of his scientific principle. Mercator's work is most interesting and accurate for the Old World, particularly Europe. He has retained in his map some of the old traditions, notably the fabulous islands in the Atlantic; he followed the Zeno map for Greenland and the neighboring regions, recording many of the fictitious names to be found in that map. Mercator's influence was far reaching, not only through this particular masterpiece, but through the numerous editions of his atlas.

40. — WORLD MAP OF BLAEU IN HEMISPHERES, 1605.

This great world map of Willem Janz Blaeu is a reproduction from the unique copy now to be found in the rich cartographical collection of The Hispanic Society of America. It is probable that it was draughted in the year 1605 by order of the Estates General of Amsterdam. Each hemisphere in the original is 120 cm. in diameter. It is therefore one of the largest as it is one of the most

detailed engraved maps of the period. Blaeu became one of the most distinguished map and globe makers of the Netherlands, a country which in the late sixteenth and early seventeenth centuries could well boast of leadership in this field.

Blaeu's map presents, with a remarkable approach to accuracy, the outlines of the Old and the New World. He has adorned it with pictures, but not of the fanciful type to be found in the work of the mediæval map makers. He has dotted the seas with exquisitely drawn ships and compass roses. He represents a great Austral Continent at the south, which he calls "Magalanica." Near the Strait of Magellan he has placed excellent portraits of the four explorers who to that date had circumnavigated the globe. There are curious but not unnatural errors in the region of Hudson's Bay and the Great Lakes. His map was drawn just before Hudson undertook his expedition by the northeast route to China, failing which he turned to the westward and explored a part of the coast of North America. A comparison here of the Blaeu map of 1605 with the Hondius map of 1611, No. 49, in many features so strikingly similar, is especially interesting.

World Map of Hondius, 1611. No. 49.

MAPS FRAMED AND HANGING ON THE WALLS OF THE BUILDING

41.—WORLD MAP OF LEARDO, 1452.

This original parchment map, one of the finest products of the skillful Italian map maker Leardo, represents the world as it was known about the middle of the fifteenth century. The west coast of Africa, where the Portuguese under the leadership of Prince Henry were actively engaged in exploration at this time, is well drawn. Many of the features of mediæval maps have, however, been retained, as the representation of important cities by the picture of a building, the Red Sea with its traditional color, the world as encircled by the ocean. The unknown region of South Africa is made somewhat conspicuous, as if to center attention in that direction. Leardo's map is oriented with the east at the top, which therefore places the south at the right. The author has surrounded his map with a broad circular band, in which he has inscribed elaborate astronomical tables, a feature which is not common to world maps of the period.

42.—MARINE WORLD CHART OF CANERIO, about 1502.

The parchment original of this chart, 225 by 115 cm. in size, is to be found in the Archive du Service Hydro-

graphique de la Marine, Paris. Canerio calls himself a Genoese. In the lower corner on the left of his map appears his signature, "Opus Nicolay de Canerio Januensis." Very little is known of the author. It is probable that he was one of a number of Italians who found employment as map makers in Portugal or in Spain in the early years of great trans-oceanic discoveries. We find in this work, as in the Cantino, No. 19, an excellent example of the earlier portolan chart, No. 9, so enlarged as to become a world chart.

Only the eastern coast line of a part of the New World appears, with a few of the West Indian Islands. Africa and the Far East, regions likewise of new discoveries and explorations, are remarkably well drawn. The chart is one of the oldest known on which wind or compass roses appear, being here grouped in a system.

43.—WORLD MAP OF WALDSEEMÜLLER, 1507.

In 1507 Martin Waldseemüller issued a little volume which he called COSMOGRAPHIÆ INTRODUCTIO. It was in this volume that the name AMERICA, as applied to a part of the New World, first appears in print. "Inasmuch as both Europe and Asia received their names from women, I see no reason why any one should justly object to calling this part Amerige, i. e., the land of Amerigo, or America, after Amerigo, its discoverer, a man of great ability," says the author in referring to the discovery of America by Vespucci.

In the same year, 1507, Waldseemüller issued this world map, the largest engraved map then known, and the first containing the name AMERICA. Though inaccurate in many of its details, it is remarkable for the

geographical knowledge which it records within fifteen years after the first trans-Atlantic voyage of Columbus. Only one of the original copies of the map is now known, this being discovered twelve years since by Professor Joseph Fischer, S. J., in the library of Prince Waldburg of Wolfegg, Germany. This facsimile is one of a number issued by Professors von Wieser and Fischer in size of the original.

44.—WORLD CHART OF WALDSEEMÜLLER, 1516.

The original of this chart was found by Professor Fischer in the same volume which contained the previously mentioned map of Waldseemüller, No. 43. It appears to be an engraved copy of Canerio's chart, No. 42, somewhat altered by the insertion chiefly of numerous ornamental details. Certain parts of the work of engraving have been attributed to Albrecht Dürer. It is in a legend on this chart Waldseemüller records that he had produced his map of 1507 in one thousand copies, only a single example of which is now known.

45.—WORLD MAP OF MAIOLLO, 1527.

In the Biblioteca Ambrosiana of Milan may be found the original of this fine example of early map making. It is 175 by 60 cm. in size, and bears the author's inscription which gives us the specific information that he draughted it in Genoa, December xxii, 1527. It possesses many striking and interesting features. In the central American region we find a strait represented, but of its real existence the author was not quite cer-

tain, seeing that he refers to it as "streito dubitoso." It is the representation of a natural waterway from the Atlantic to the Pacific in that day sought for by explorers, but a dream to find its realization in the artificial passageway soon to be opened.

The sweep of the west coast of North America, approaching the Atlantic coast in the region of Chesapeake Bay, resembles the Verrazano map of 1529, which indicates a peculiar misconception as to the distance from the Atlantic to the inland or western sea, often on later maps referred to as the Sea of Verrazano.

46.—WORLD MAP OF VERRAZANO, 1529.

In the museum of the College of the Propaganda, Rome, is preserved the original of this large world map, which is 260 by 130 cm. in size, and which, as an inscription tells us, was made by "Hieronemus de Verrazano," the brother of the great explorer. In its outlines of the New World it clearly resembles the map of Maiollo, No. 45. Numerous regional names appear, as "Terra Laboratoris," "Terra Florida," "Hispania," "Terra America"; landscapes are represented, and the Old World continents, in particular Europe and Africa, have been represented with a remarkable approach to accuracy. The names inscribed along the Atlantic coast of the New World are of great historical interest. Here is recorded the information brought back to France by Giovanni Verrazano, who had explored this region in 1524 for King Francis I, at which time he had visited and roughly charted, among other localities, that of New York Bay.

47.—WORLD MAP OF MERCATOR, 1538.

Of this world map, representing the earliest work of Mercator, but two of the original copies are known; the one here referred to belonging to The American Geographical Society, the other being in the possession of the New York Public Library. The peculiar heart shape is but one of the many designs worked out by the cartographers of the period in their search for the most effective plan for representing the world on a plane surface. The map records in a fairly accurate and general manner the geographical knowledge respecting the world as known at the time it was engraved. For the first time on a map the name AMERICA is here given to both the northern and the southern continent of the New World, that is, to North and to South America, a name which Waldseemüller, No. 43, gave only to a section of South America. A comparison of Mercator's map of 1538 with his map of 1569, No. 39, will not be without interest.

48.—WORLD MAP OF SEBASTIAN CABOT, 1544.

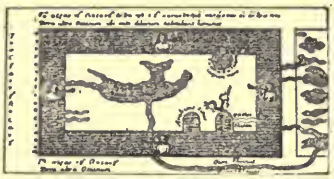
See No. 35 for a description of the Sebastian Cabot Map, which is here reproduced in size of the original.

49.—WORLD MAP OF HONDIUS, 1611.

The only known original copy of this map was found in 1901 in Wolfegg Castle by Professor Joseph Fischer. Hondius was one of the most distinguished cartographers of his day, and in this world map we have perhaps the finest illustration of his knowledge and skill.

At the extremity of South America appear the por-

traits of the four men who, prior to the engraving of his map, had circumnavigated the globe. An interesting record, inscribed northeast of Europe, tells us that Hudson reached this point, but was blocked by the ice. This is the first map record of the failure of Hudson in that region, the result of which failure led him to turn his attention to a western expedition and to the discovery of the Hudson River. The map is one of the first to represent the currents of the ocean and the trade winds, with an indication of the direction of the same. In explanation of his ornamental border, which is an attractive feature, Hondius tells us that "for adornment and for entertainment" he has here represented the various animals which are useful to man.



World Map of Cosmas. No. 2.

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